

MITIGATION MEASURES

There are no significant impacts; therefore no mitigation measures are required under NEPA.

4.13 SUMMARY OF SECONDARY AND CUMULATIVE IMPACTS

Secondary impacts are those that are caused by a Proposed Action, but may occur later in time or farther removed in distance, relative to the primary impacts of the Proposed Action.

"Cumulative impacts result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions" (40 CFR Section 1508.7).

This Site-Wide EA considers past, present and reasonable foreseeable short-term and long-term future actions on the site. In addition, it considers off-site factors and reasonably foreseeable off-site projects.

Reasonably foreseeable off-site projects considered in the cumulative impacts analysis include ongoing aggregate mining in the site vicinity and a wide range of land development in the communities east of the site and along Highway 93.

Cumulative and secondary impacts are discussed in Sections 4.1 through 4.12, as appropriate. The most important examples of secondary and cumulative impacts associated with the Proposed Action are as follows:

- Traffic congestion at the Highway 93/128 intersection;
- Regional and local air pollutant emissions;
- Front range development intensification and changing landscapes;
- Habitat conversion and increased mortality risk for wildlife and plant habitats;
- Demand for energy; and
- Beneficial impacts from improved alternative energy sources.

As stated in Chapter 4, the Proposed Action's incremental impact on these secondary and cumulative impacts would be insignificant and the No Action alternative would not contribute to these impacts. Cumulative impacts are important to identify, but characterizing their significance is difficult because to some degree these impacts are speculative and may or may not be addressed or mitigated by entities with discretionary authority over reasonably foreseeable projects or efforts that are not foreseeable today. One example would be interim and long-term measures to address congestion issues at the Highway 93/128 intersection. Future plans call for an interchange at this location, but no funding or schedule commitments are currently in place.

4.14 IRREVERSIBLE/IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible commitment of resources is defined as the loss of future options. The term applies primarily to the effects of use of nonrenewable resources such as minerals or cultural resources, or to those factors such as soil productivity that are renewable only over long periods. It could also apply to the loss of an experience as an indirect effect of a "permanent" change in the nature or character of the land. An irretrievable commitment of resources is defined as the loss of production, harvest, or use of natural resources. The amount of

production foregone is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume production.

The Proposed Action would not have irreversible impacts because future options for using this site would remain possible. A future decommissioning process could restore the site for alternative uses, ranging from natural open space to urban development. No loss of future options would occur.

The primary irretrievable impacts of the Proposed Action would involve the use of energy, labor, materials and funds, and the conversion of some lands from a natural condition through the construction of buildings and facilities. Irretrievable impacts would occur as a result of construction, facility operation and maintenance activities. Direct losses of biological productivity and the use of natural resources from these impacts would be inconsequential, and would be offset by the mission of the NWTC to improve energy efficiency and renewable energy technology and by the generation of renewable power by turbines, distributed energy systems, and other facilities at the NWTC and elsewhere.

4.15 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The following discussion addresses the commitment of resources associated with the Proposed Action relative to the loss of long-term productivity associated with these commitments.

The Proposed Action would commit resources in the form of energy, labor, materials, and funds over 20 years or more. The justification for these commitments at this time is described in Section 1.1 Purpose and Need. Long-term productivity associated with the site relates to agricultural value for livestock grazing, biological value as habitat and open space values associated with aesthetic quality and recreation. The Proposed Action would involve the use of lands where these values have already been compromised by facility development and operations so any losses would be incremental and insignificant and off-set by the potential for the Proposed Action to improve energy efficiency and harness renewable energy resources. Improved efficiency and increased reliance on renewable energy resources could substantially reduce reliance on coal, oil, and nuclear fuels and reduce resource productivity losses in resource extraction areas.

No long-term risks to public health and safety would be created by the Proposed Action.

4.16 UNAVOIDABLE ADVERSE IMPACTS

There would be no significant unavoidable adverse impacts of the short-term or long-term components of the Proposed Action. However, some adverse impacts would be expected. These impacts and corresponding mitigation measures are described throughout Chapter 4 and are listed in the Summary of this document.